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EXAMINER

NEURAUTER, GEORGE C

ART UNIT PAPER NUMBER

2143

DATE MAILED: 04/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/037,067

Applicant(s)

CLUNE ET AL.

Examiner

George C. Neurauter, Jr.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 20 March 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

Claims 1-15 are currently presented and have been examined.

***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 20 March 2006 has been entered.

***Response to Arguments***

Applicant's arguments filed 20 March 2006 have been fully considered but they are not persuasive.

The Applicant argues that Bonomi does not teach or suggest a physical address queue of destination addresses as amended.

First, the Applicant points to the specification for support for the amendments made to the claims. The amended claims recite a "physical address", however, there is no support for a "physical address" anywhere within the specification. The specification does disclose in paragraph 0020 that "...the 'A' list is entered at an entry point A1, and traverse through entries for the multicast destination nodes A2, A3, A4, A5 and

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then back to A1. As the processing engine reaches a list entry, the contents are processed (to determine the appropriate data transmission attributes of the packet, as discussed above, for successful transmission of the packet to the destination address)..." Assuming that this is the "physical address" the Applicant is referring to in the claims, as noted above, this element as recited is not found within the specification. As also recited in the claim, an address is used is associated with a node entry for receiving multicast data and another address is identified for entering the list. Therefore, it is unclear to the Examiner exactly which address is being referred to regarding the "physical address". In order to advance prosecution, the Examiner will assume that a destination node address is the "physical address" and the "associated address for receiving multicast data" that is referred to within the claim. However, it is clear that the claims require amendment in order to clearly point out which address is being referred to in light of the specification.

Bonomi discloses:

"The present invention minimizes the amount of required memory while processing multicast cells. Only a single copy of the multicast cells is saved forming a physical queue. Several logical queues are defined (one for each output branch for the

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multicast) based on the physical queue. The logical queues are processed to schedule and transmit packets on each output branch. Also, the present invention minimizes the processing required upon the arrival of a new cell on a multicast connection. Such minimization enables an increased throughput performance in a switch of the present invention." (column 4, lines 1-11)

"FIG. 5 is a block diagram of the data structures used by an embodiment of the present invention to maintain and process several logical queues based on a physical queue, with each logical queue corresponding to one of several output branches forming a multicast transmission." (column 6, lines 63-67)

"For multicast cells to be transmitted on more than one port of a port card, the port-mask will indicate that transmission is required to more than one port. In one embodiment, only one branch of a physical queue can be transmitted on a port, and a bit is therefore maintained for each branch/port. One value indicates that the cells corresponding to the QID need to be transmitted on a corresponding port, and the other value indicates that the cell should not be transmitted on the port. Cells for each output branch are identified by a logical queue. All the logical queues are based on a single physical queue." (column 11, lines 36-47)

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"As an illustration, FIG. 5 illustrates the manner in which packets received on a multicast connection are stored and processed. The multicast connection has two output branches (1 and 2) defined by head-pointers 1 and 2 (HP1 and HP2) respectively. The two branches share tail pointer TP1. Each logical queue (branch) can be processed independent of other logical queues. To schedule packets on a logical queue for transmission, scheduler 470 traverses the linked list using the corresponding head pointer, and schedules each traversed cell for transmission. In FIG. 5, the cells corresponding to logical queue 2 are processed at a higher speed, and accordingly head pointer 2 points to a later cell (510-L) in the cell order. The processing of logical queue 1 is behind by three cells (510-A, 510-C, and 510-D) in this illustration." (column 13, lines 46-60)

In view of the above disclosures and as shown previously by the Examiner, Bonomi does disclose a queue that contains a linked list of destination addresses to which multicast transmissions to a plurality of receiving nodes are sent. Therefore, Bonomi does disclose the amended limitations and the claims are not in condition for allowance.

***Claim Rejections - 35 USC § 112***

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-15 recite a "physical address". It is unclear as to what physical address is being referred to in light of the specification.

In order to avoid piecemeal examination and to give the Applicant a better appreciation for relevant prior art, the Examiner will assume that the "physical address" is the "associated address for receiving multicast data" as also recited within the specification". See, e.g., *Ex parte Ionescu*, 222 USPQ 537 (Bd. App. 1984) and MPEP 2173.06.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the

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art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).



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Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6 219 352 to Bonomi et al in view of "The Art of Computer Programming: 2<sup>nd</sup> Edition" to Knuth.

Regarding claim 1, Bonomi discloses a method for identifying destination nodes of a multicast session in a network having a plurality of nodes, comprising forming a physical address queue comprising a linked list ("queue") further comprising a plurality of destination node entries each node entry having an associated address for receiving multicast data; identifying an address ("head pointer") for entering the list at an initial destination node entry; traversing the linked list for sending the multicast data to the destination nodes; and terminating the traversing step prior to reaching the initial destination node entry (at the "tail pointer"). (column 10, line 61-column 11, line 35; column 13, lines 40-column 14, line 2, specifically column 13, lines 46-60)

Bonomi does not expressly disclose a circularly linked list, however, Knuth does disclose a circularly linked list (page 270, section 2.2.4 "Circular Lists", specifically "A circularly-linked list...has the property that its last node links back to the first...It is then possible to access all of the list starting at any given point")

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of these references since Knuth discloses that using a circularly linked list allows for entry into the list at any point (page 270, section 2.2.4 "Circular Lists", specifically "It is then possible to access all of the list starting at any given point"). In view of these specific advantages and that the references are directed to traversing linked lists or queues and entering a linked list at a given point, one of ordinary skill would have been motivated to combine these references and would have considered them to be analogous to one another based on their related fields of endeavor.

Regarding claim 2, Bonomi and Knuth disclose the method of claim 1.

Bonomi discloses the method further comprising receiving data intended for transmittal to the identified destination nodes of the multicast session. (Figure 2, step 220; column 7, line 54-column 8, line 36, specifically column 7, lines 56-61; column 13, lines 46-48)

Regarding claim 3, Bonomi and Knuth disclose the method of claim 2.

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Bonomi discloses wherein the initial destination node entry is determined from the received data. (column 10, lines 12-60, specifically lines 16-22; column 11, lines 18-47).

Regarding claim 4, Bonomi and Knuth disclose the method of claim 2.

Bonomi discloses wherein at least one destination node of the list, as determined from the received data, is excluded from the multicast session. (column 14, lines 17-25).

Regarding claim 5, Bonomi and Knuth disclose the method of claim 4.

Bonomi discloses wherein the received data includes an indicator identifying the destination node that is to be excluded from the multicast session. (column 14, lines 17-25)

Regarding claim 6, Bonomi and Knuth disclose the method of claim 5.

Bonomi discloses wherein the indicator identifies the destination node from which the data was received as the destination node to be excluded from the multicast session. (column 2, lines 45-67; column 14, lines 17-25).

Regarding claim 7, Bonomi and Knuth disclose the method of claim 1.

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Bonomi discloses wherein the initial destination node entry is predetermined (column 13, lines 40-column 14, line 2, specifically column 13, lines 52-55)

Regarding claim 8, Bonomi and Knuth disclose the method of claim 1.

Bonomi discloses the method further comprising receiving data intended for transmittal to the identified destination nodes of the multicast session on an input port, and wherein the initial destination node entry is determined based on the input port. (column 10, lines 12-60, specifically lines 16-22; column 11, lines 18-47; column 14, lines 47-58)

Regarding claim 9, Bonomi and Knuth disclose the method of claim 1.

Bonomi discloses wherein the address for entering the list is the destination node from which the data was received. (column 10, lines 12-60, specifically lines 16-22; column 11, lines 18-47)

Regarding claim 10, Bonomi and Knuth disclose The method of claim 1.

Bonomi discloses wherein the traversed destination node entries are the identified destination nodes of the multicast session. (column 13, lines 46-60)

Regarding claim 11, Bonomi and Knuth disclose the method of claim 1 wherein destination node entries for a plurality of multicast sessions are interleaved in a list, and wherein the destination node entries for each one of the plurality of multicast sessions are linked. (column 13, lines 18-25)

Bonomi does not expressly disclose a circularly linked list, however, Knuth does disclose this limitation (page 270, section 2.2.4 "Circular Lists", specifically "A circularly-linked list...has the property that its last node links back to the first...It is then possible to access all of the list starting at any given point").

Claim 11 is rejected since the motivations regarding the obviousness of claim 1 also apply to claim 11.

Regarding claim 12, Bonomi and Knuth disclose the method of claim 1.

Bonomi discloses wherein each destination node entry includes link information ("memory address"), and wherein the step of traversing the linked list comprises traversing the linked list according to the link information at each destination node entry. (column 10, lines 12-60, specifically lines 16-22; column 11, lines 18-47; column 13, lines 40-column 14, line 2, specifically column 13, lines 46-60)

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Regarding claim 13, Bonomi and Knuth disclose the method of claim 12.

Bonomi discloses wherein the link information comprises a pointer at each destination node entry that points to another destination node entry such that the plurality of destination node entries are linked.

Bonomi does not disclose wherein the destination node entries are circularly linked, however, Knuth does disclose wherein entries are circularly linked (page 270, section 2.2.4 "Circular Lists", specifically "A circularly-linked list...has the property that its last node links back to the first...It is then possible to access all of the list starting at any given point").

Claim 13 is rejected since the motivations regarding the obviousness of claim 1 also apply to claim 11.

Claim 14 is rejected since claim 14 recites a method that contains substantially the same limitations as recited in claims 1 and 12 in combination.

Claim 15 is rejected since claim 15 recites an apparatus that contains substantially the same limitations as recited in claim 1.

#### **Conclusion**

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to George C. Neurauter, Jr. whose telephone number is (571) 272-3918. The examiner can normally be reached on Monday through Friday from 9AM to 5:30PM Eastern.

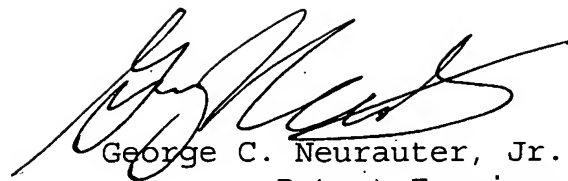
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wiley can be reached on (571) 272-3923. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to read "G. Neurauter, Jr.", is written over the printed name.

George C. Neurauter, Jr.  
Patent Examiner